

ResultsTABLE I  
Orifice Diameters

Orifice at top of head	-	.182 inches
Orifice at input to head Sample Number E-100-401 Old version	-	.469 inches
Orifice at input to head Sample Number E-100-403 New version	-	.177 inches
Orifice at input to head Sample Number E-100-406 Retrofit restrictor	-	.173 inches


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TABLE II  
Water Flow and Velocity Results

Sample Number	Input to Hose Pressure (psi)	Input to fun Head Pressure (psi)	Flow Rate (gal/ min)	Water Exit Velocity (ft/sec)	Water Velocity at 3 ft (ft/sec)	Comments
E-100-401 (w/o restrictor) d version	33	25	4.8	59.1	57.5	Hose connected in electrical lab (130 ft from water main input to building).
	46	33.5	5.48			
	50	36	5.59			
	47.5	34	5.50			
Averages	47.8	34.5	5.52	67.8	66.4	Hose connected in boiler room (at water main input to building).
E-100-403 (w/restrictor) w version	45	40	3.7	44.9	42.7	Hose connected in electrical lab.
	54	48	3.68			
	50	45	3.66			
	48	43.5	3.61			
Averages	50.7	45.5	3.65	44.9	42.7	Hose connected in boiler room.
	47	33	3.65	44.9	42.7	Hose connected in boiler room (pressure reduced to 33 input).
E-100-406 (w/o retrofit restrictor)	52	36	6.10	75.1	73.8	
(w/retrofit restrictor)	50	46	3.48	42.8	40.5	Hose connected in boiler room.

## Discussion of Results

Table II shows that the fun fountains that do not have a restrictor in the water flow path have water exit velocities ranging from 59.1 to 75.1 ft/sec. The fun fountains with restrictors have water exit velocities ranging from 42.8 to 44.9 ft/sec. Fun fountain sample number E-100-403 (new version) has a water exit velocity of 44.9 ft/sec over the range of 33 to 45.5 psi fun fountain head input pressures. This shows that the restrictor is limiting the velocity of the exit water.

Test Nos. 10 and 11 show the effect of the retrofit restrictor. Without the restrictor, fun fountain sample number E-100-406 had a water exit velocity of 75.1 ft/sec while with the retrofit restrictor, the water exit velocity was limited to 42.8 ft/sec.

The input hose pressures observed during the testing at the Engineering Laboratory were in the range of 33 to 54 psi depending where in the building the hose connection is made. The Washington Suburban Sanitary Commission restricts residential pressures to 60 psi or less. However, it has been observed in Utah that residential pressures as high as 90 psi are not uncommon. When the data on the old version of the fun fountain sample number E-100-401, without a restrictor at 47.8 psi is projected to 90 psi, the resultant water exit velocity is approximately 100 ft/sec.

cc:  
ESEP(T. Cooper)

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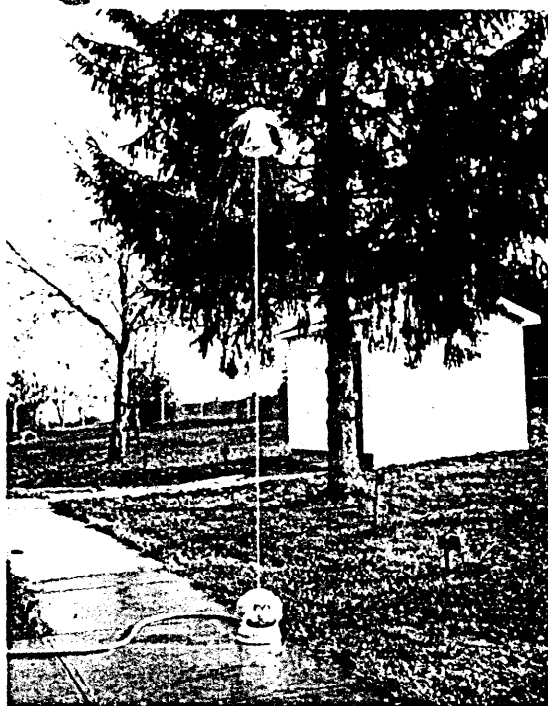


Photo #1 - Sample number E-100-401 Fun Fountain  
in operation.



Photo #2 - Sample number E-100-401 Fun Fountain  
clown head front view.

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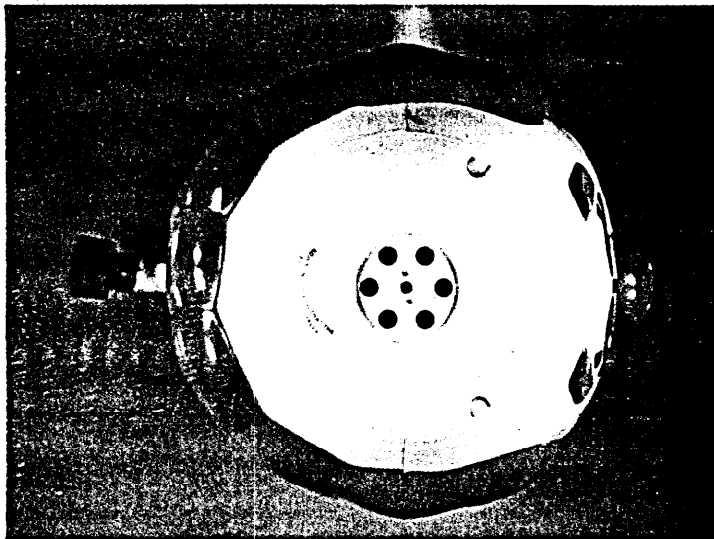


Photo #3 - Sample number E-100-401 Fun Fountain  
clown head top view.



Photo #4 - Sample Number E-100-401 Fun Fountain  
water supported hat.

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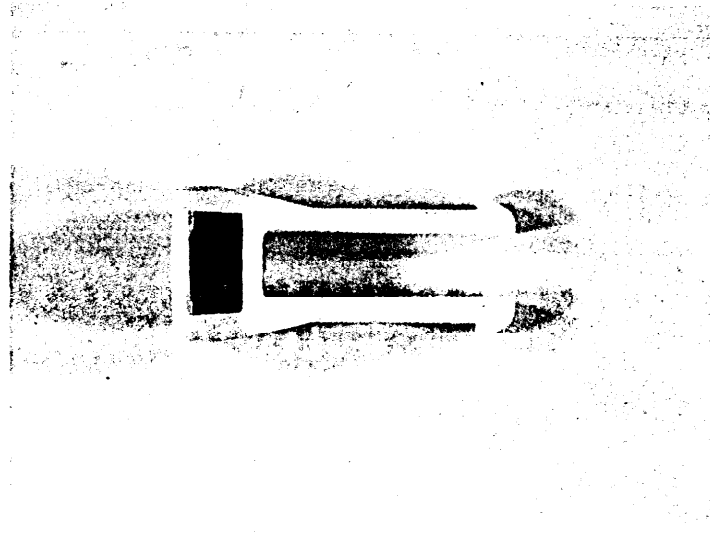


Photo #5 - Sample number E-100-406 Retrofit restrictor side view.

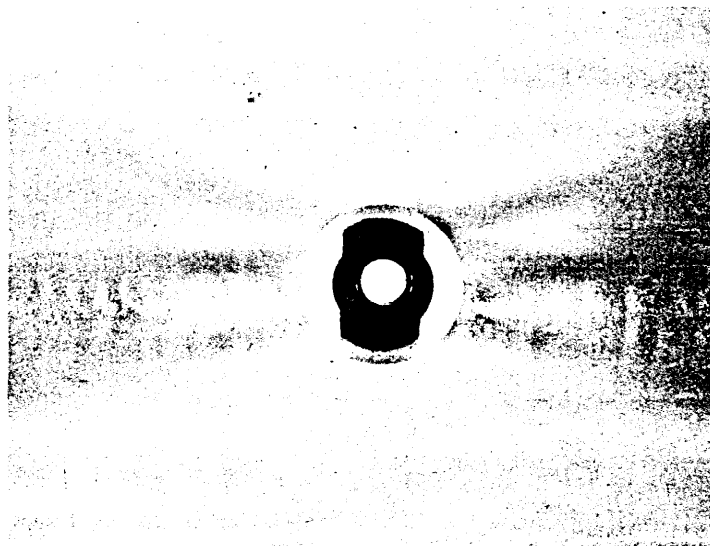


Photo #6 - Sample number E-100-406 Retrofit restrictor front view.

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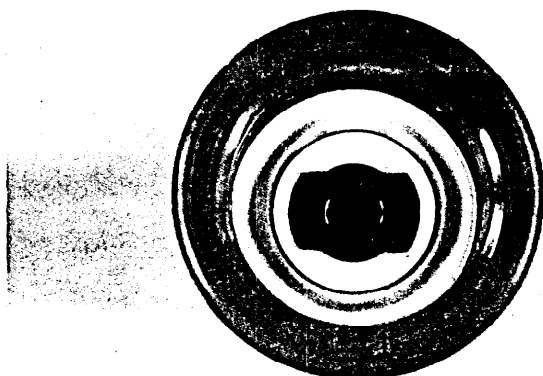


Photo #7 - Sample number E-100-406 Retrofit restrictor front view in place in head input hose connection.

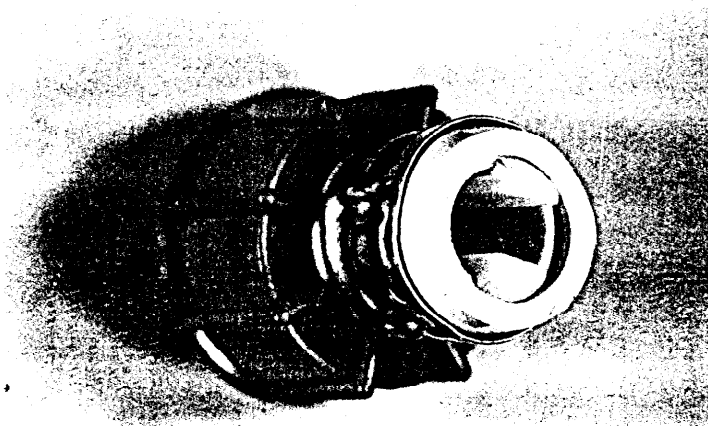


Photo #8 - Sample number E-100-406 Retrofit restrictor in place rear view showing how it is held in place.

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